

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

TQ DELTA, LLC, v. 2WIRE, INC.	Plaintiff, Defendant.	Civil Action No. 13-cv-1835-RGA
TQ DELTA, LLC, v. and ZYXEL CORPORATION,	Plaintiff, COMMUNICATIONS Defendants.	Civil Action No. 13-cv-2013-RGA
TQ DELTA, LLC, v. ADTRAN, INC.	Plaintiff, Defendant.	Civil Action No. 14-cv-954-RGA
ADTRAN, INC., v.	Plaintiff,	Civil Action No. 15-cv-121-RGA
TQ DELTA, LLC.	Defendant.	

**LETTER TO THE HONORABLE RICHARD G. ANDREWS
REGARDING '627 PATENT**

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Your Honor:

Claims 2 and 21 of the '627 patent do not change Defendants' position that the limitation "substantially scramble the phase characteristics of the plurality of carrier signals"—found in all asserted claims of the Family 4 patents—is indefinite. These dependent claims require the step of modulating the bits of the input bit stream or a modulator capable of modulating the bits of the input bit stream "onto the carrier signals having the substantially scrambled phase characteristics to produce a transmission signal with a reduced peak-to-average power ratio (PAR)." A10 ('627 patent) at claims 2 & 21. Although these claims suggest a connection between "substantially scramble the phase characteristics of the plurality of carrier signals" and a transmission signal with a reduced peak-to-average power ratio, reference to a reduced PAR does not inform a person of skill in the art with reasonable certainty how much reduction is required in order to substantially scramble the phase characteristics of the carrier signals. A355-A356 (Zimmerman Decl.) ¶¶ 35-36. Thus, even assuming the proper construction of "substantially scramble" should be referenced to "reduced PAR," the term remains indefinite.

Claims 2 and 21 do not solve the problem that the specification describes a spectrum of results that may follow from "substantially scrambl[ing]," but fails to provide a reasonably certain answer as to the degree of scrambling or reduction in PAR that is required to satisfy the asserted claims. To support its position that the term is definite *and that it requires only a nominal reduction in PAR*, Plaintiff points to the passage stating that "[b]y scrambling the phase characteristics of the carrier signals, the phase scrambler 66 reduces (with respect to unscrambled phase characteristics) the combined PAR of the plurality of carrier signals and, consequently, the transmission signal 38." A7 ('627) patent at 6:55–59. Notably, this passage does not refer to "substantially scramble,"

but rather “scramble.” As Defendants previously argued, the specification also explains that substantially scrambling the phase characteristics of the carrier signals results in a “transmission signal 38 [that] has a substantially minimized peak-to-average (PAR) power ratio.” A6 ('627 patent) at 4:39–42. And it further equates a “substantially minimized PAR” with a “transmission signal 38 [that] has a Gaussian probability distribution.” A7 ('627 patent) at 5:15–17. Here, the specification is linking the claim language at issue—“substantially scramble”—and “substantially minimized PAR.”¹

Thus, compared to Plaintiff’s limited support for its position that “substantially scrambl[ing]” requires no more than a nominal reduction in PAR, the specification points equally or even stronger to the conclusion that the “substantially scrambl[ing]” results in a substantially minimized PAR with a Gaussian probability distribution. One of skill in the art would understand those are markedly different results. A385-A386 (Zimmerman Sur-Reply Decl.) ¶ 9. For his part, Plaintiff’s expert acknowledges that “when phases [of the carriers] are *sufficiently random*, the DMT signal can be approximated as having a Gaussian probability density and therefore has a *low PAR*,” A315 (Chrissan Opening Decl.) ¶ 38 (emphasis added) (citing A5 at 1:46–49 and 1:55–60), yet maintains that the “substantially scramble” limitation includes any reduction in PAR as compared to an unscrambled signal, A378 (Chrissan Reply Decl.) at ¶ 10. Plaintiff’s expert fails to reconcile these divergent positions, and between these widely divergent results, a person of skill in the art would not be able to discern with reasonable certainty the correct scope of the invention. A386 (Zimmerman Sur-Reply Decl.) ¶¶ 11-12.

¹ Adding a third data point, the specification also describes a “low PAR” as the aim of the invention. A5 ('627 patent) at 2:24–26 (“a system and method that can effectively scramble the phase of the modulated carrier signals in order to provide a low PAR for the transmission signal.”).

Additionally, claims 2 and 21 do not resolve Defendants' separate point that the term is indefinite because the specification does not disclose how to measure the degree of scrambling necessary to "substantially scramble." Joint Br. at 53-54, 58.

Claims 2 and 21 also do not change the scope of Defendants' alternate construction. As noted above, Plaintiff's only intrinsic support for the scope of the term encompassing any nominal reduction is a single statement made in reference to "scrambling" the phase characteristics, not "substantially scrambling" the phase characteristics. In addition, Plaintiff's nominal reduction construction verges on non-limiting. As Dr. Zimmerman explained, "Nearly any modification of the carrier signal phase characteristics would change the amplitude distribution of the combined carrier signals making up the DMT symbol." A385 (Zimmerman Decl.) ¶ 9. On the other hand, Defendants' position that "substantially scrambl[ing]" the phase characteristics must result in a transmission signal with a Gaussian probability distribution is supported by the specification's linkage of "substantially scrambling," "substantially minimized PAR," and a Gaussian probability distribution. A6-A7 ('627 patent) at 4:39-42, 5:15-17. And, as explained during the hearing, a nominal reduction in PAR can still result in a transmission signal that is not sufficiently random and thus still clips. However, in light of the reference to "reduced peak-to-average power ratio (PAR)" in claims 2 and 21, Defendants would amend their alternate construction to "adjust the phase characteristic of each of the plurality of carrier signals by varying amounts to generate a transmission signal with a Gaussian probability distribution that produces a reduced peak-to-average power ratio (PAR)." While acknowledging the reference to reduced peak-to-average (PAR) in claims 2 and 21, this construction maintains Defendants' position that the scope of the term should require a reduction sufficient to produce a transmission signal with a Gaussian probability distribution. Claims 2 and 21 then further narrow the invention of claims 1 and 20 by

reciting the additional step of modulating the bits onto the carriers (claim 2) or adding the new limitation of a modulator that is capable of doing so (claim 21).

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